that we have in relativity are also the coefficients of a quadratic expression.

If you are going to describe some particular physical phenomena such as those described by the relativistic theory of the spinning electron, you must pick out one or more particular spinors which embody the physical phenomena in question. It turns out in this special case that you can pick spinors which set up a suitable relationship between the quadratic equation (4) above and the fundamental quadratic form which appears in the relativity theory. The general theory of spinors is the theory of all possible physical quantities of a certain sort. The theory of the electron is the theory of certain particular spinors which describe this electron.

BOTANY.—*New species of* Aulacolepis *and other grasses.*[1] A. S. Hitchcock, Bureau of Plant Industry.

The genus *Aulacolepis* was established by Hackel who based it upon *Deyeuxia treutleri* Stapf (*Milium treutleri* Kuntze). It is allied to *Agrostis* and to *Calamagrostis* (Sect. *Deyeuxia*), differing from the former in the comparatively large firm lemma and from most of the species in the prolonged rachilla, and from *Calamagrostis* in the absence of the long callus hairs and the dorsal awn. Hackel described a second species, *A. japonica*, from Japan, and recently a third species, *A. milioides* (Honda) Ohwi, has been described from the same country. *Aniselytron agrostoides* Merr., of the Philippines, described as differing from *Aulacolepis* chiefly in the obsolete or much reduced first glume may also belong to that genus. In the present paper two species are added to this interesting genus, one from Borneo, the other from Tonkin.

Aulacolepis clemensae Hitchc., sp. nov.

Perennis (?); culmi ascendentes, glabri, circa 60 cm. alti; ligula firma, truncata, 1 mm. longa; laminae planae, 8–15 cm. longae, 5–8 mm. latae; panicula laxa, 8–18 cm. longa, ramis ascendentibus, 3–5 cm. longis; glumae inaequales, acuminatae, prima 1-nervia, 2 mm. longa, secunda 3-nervia, 2.5 mm. longa; lemma quam glumae firmius, lanceolatum, scaberulum, 3 mm. longum; processus rachillae tenuis, 0.5 mm. longus.

Apparently perennial; culms ascending, glabrous, several-noded, about 60 cm. tall; sheaths glabrous; ligule firm, truncate, 1 mm. long; blades flat, slightly scaberulous beneath, puberulent on the upper surface, scaberulous on the margins, narrowed toward the base, acuminate, 8 to 15 cm. long, 5 to 8 mm. wide at the middle; panicle rather loose and lax, short exserted or inclosed at base in the uppermost sheath, 8–18 cm. long, the axis angled,

[1] Received April 17, 1934.

nearly glabrous, the branches slender, flexuous, scabrous, somewhat distant, ascending, 3 to 5 cm. long, the branchlets few-flowered; glumes unequal, acuminate, keeled, slightly scaberulous on the keels, the first 1-nerved, 2 mm. long, the second 3-nerved, 2.5 mm. long; lemma lanceolate, compressed, firmer than the glumes, scaberulous over the surface, 5-nerved, the lateral nerves near the margin, the intermediate nerves faint, 3 mm. long, minutely pubescent at base; palea about as long as the lemma but narrower, acuminate, minutely pubescent, inclosed within the lemma, the two keels compressed together; rachilla prolonged between the keels of the palea as a minute bristle 0.5 mm. long.

Type in the U. S. National Herbarium, no. 1,538,647, collected on the boulder margin of the Masilau River, Mount Kinabalu, British North Borneo, alt. about 3000 meters, December 26, 1933, by Mrs. M. S. Clemens (no. 34448).

Aulacolepis petelotii Hitchc., sp. nov.

Perennis (?); culmi caespitosi, erecti, glabri, 25–40 cm. alti; ligula membranacea, 2 mm. longa; laminae erectae, planae, scaberulae, 4–8 cm. longae, 1–3 mm. latae; panicula angusta, laxa, pallida, 6–10 cm. longa; glumae aequales, compressae, 2 mm. longae; lemma circa 2 mm. longum, chartaceo-membranaceum, lanceolatum, 5-nervium, sub apice minute aristatum, callo breviter piloso; rachilla ultra florem in stipitem brevissimum nudum producta; palea angusta, 1.5 mm. longa; stamina 3, antheris 0.5 mm. longis.

Apparently perennial, culms many in a rather loose tuft, erect, or the outer ones somewhat geniculate at base, glabrous, about 3-noded, 25–40 cm. tall; sheaths glabrous; ligule membranaceous, ovate, dentate or somewhat lacerate, about 2 mm. long; blades erect or ascending flat, scaberulous beneath, scaberulous-puberulent on the upper surface, striate-nerved, 4–8 cm. long, 1–3 mm. wide; panicles narrow, loose, pale, whitish or greenish, more or less inclosed in the upper sheaths, 6–10 cm. long, the axis scabrous, the branches scabrous, slender, naked below, branching, the spikelets clustered near the ends of the branchlets, the ultimate pedicels 1 mm. long or less; glumes equal, compressed, narrow, rather abruptly acute, minutely roughened on and near the keel, about 2 mm. long; lemma slightly longer and less compressed than the glumes, chartaceo-membranaceous, lanceolate, 5-nerved, the midnerve projecting just below the tip as a very short awn, the callus short-pilose, the rachilla prolonged behind the palea as a very minute naked bristle; palea narrow about three-fourths as long as the lemma; stamens 3, the anthers 0.5 mm. long.

Type, in the U. S. National Herbarium, no. 1,538,648, collected along a road near Chapu, Tonkin, alt. about 1900 meters, August, 1933, by A. Petelot (no. 4743).

Muhlenbergia lindheimeri Hitchc., sp. nov.

Perennis; culmi erecti, 1–1.5 m. alti, vaginis inferioribus imbricatis compressis; ligula elongata; laminae elongatae, planae, interdum plicatae, 3 mm. latae, scaberulae vel glabrae; panicula angusta, pallida, densiuscula, erecta, 20–40 cm. longa, ramis appressis 2–5 cm. longis; spiculae 2.5–3 mm. longae; glumae aequales, acutae vel obtusiusculae, scabro-puberulentae vel glabriusculae; lemma 2.5–3 mm. longum, glabrum vel obscure pubescens muticum, raro aristatum, arista 1–3 mm. longa.

Perennial; culms erect, 1 to 1.5 meters tall, the numerous overlapping lower sheaths keeled; ligule rather thin, elongate, mostly hidden in the folded base of the blade, blades elongate, firm, flat or usually folded, about 3 mm. wide, scaberulous or glabrous; panicle narrow, pale, somewhat loose, erect, 20 to 40 cm. long, the branches ascending or appressed; spikelets 2.5 to 3 mm. long; glumes equal, acute to rather obtuse, scabrous-puberulent to nearly smooth; lemma usually a little shorter than the glumes, 3-nerved, glabrous or obscurely pubescent, awnless or rarely with an awn 1 to 3 mm. long.

Type in the U. S. National Herbarium, no. 998,949, collected in Texas in 1847 by F. Lindheimer (no. 725).

Other specimens, all from Texas, are: *Berlandier* 1870; *Carter* 19; *Lindheimer* 1255 (Distr. Mo. Bot. Gard.); *E. J. Palmer* 10859, 11004; *Reverchon* 1610; *Silveus* 11, 354, 355; *Tharp* 70, 3076.

This species has been confused with the closely related *M. fournieriana* Hitchc. (*Epicampes berlandieri* Fourn., not *Muhlenbergia berlandieri* Trin.) which is confined to Mexico.

About 1902 there appeared in Queensland, Australia, a species of *Phalaris* which gave promise of being a valuable forage grass. About 1907 it was distributed from the Toowoomba Botanic Gardens, Queensland, and was first grown in the United States at the California Experiment Station and later at other stations. Burbank has distributed the grass as Peruvian winter grass. The species was named by Hackel *Phalaris stenoptera*. It differs from *P. tuberosa* L. only in having a loosely branching rhizomatous base, the lower internodes little or not at all swollen (*P. tuberosa* has a distinctly tuberous base). Agriculturally it seems sufficiently distinct to warrant recognition as a variety.

Phalaris tuberosa var. **stenoptera** (Hack.) Hitchc.

Phalaris stenoptera Hack. Repert. Sp. Nov. Fedde 5: 333. 1908.

Stipa coronata var. **depauperata** (Jones) Hitchc.

Stipa parishii var. *depauperata* Jones, Contr. West. Bot. 14: 11. 1912. Detroit, Utah, *Jones* in 1891.
Stipa parishii Vasey, Bot. Gaz. 7: 33. 1882. San Bernardino Mts., *Parish Bros.* 1079.
Stipa coronata parishii Hitchc. Contr. U. S. Nat. Herb. 24: 227. 1925.

This change is necessary under the International Rules which require that the earliest legitimate name in its own category be retained.

Manisuris altissima (Poir) Hitchc.

Rottboellia altissima Poir. Voy. Barb. 2: 105. 1789.
Rottboellia fasciculata Lam. Tabl. Encycl. 1: 204. 1791.
Hemarthria altissima Stapf & Hubbard, Kew Bull. Misc. Inf. 1934: 109. 1934.